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Patent Abstracts of Japan

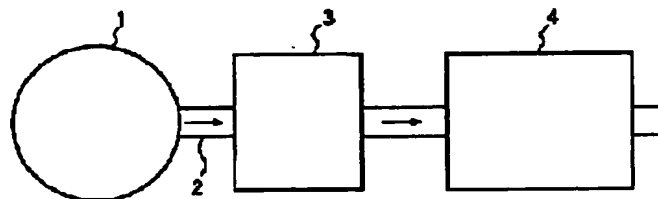
PUBLICATION NUMBER : 11262631
PUBLICATION DATE : 28-09-99

APPLICATION DATE : 17-03-98
APPLICATION NUMBER : 10066658

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INT.CL. : B01D 53/62 B01D 53/14 B01D 53/94
B01J 20/04



TITLE : EXHAUST GAS CLEANING SYSTEM

ABSTRACT : PROBLEM TO BE SOLVED: To considerably reduce harmful components discharged from auto exhaust gas, etc., into the air by disposing a gaseous CO₂ absorption material that absorbs CO₂ at a specified temp. or above in an exhaust pipe between a burner using a hydrocarbon component as fuel and an exhaust gas cleaning catalyst through which the exhaust gas of the burner passes.

SOLUTION: A gaseous CO₂ absorption material 3 that absorbs CO₂ at $\geq 400^{\circ}\text{C}$ is connected to a burner 1 using a hydrocarbon component as fuel by way of an exhaust pipe 2 and an exhaust gas cleaning catalyst 4 is disposed in the exhaust pipe 2 behind the absorption material 3. As the absorption material 3 which has properties to absorb CO₂ at $\geq 400^{\circ}\text{C}$ is cited, e.g. a conjugated oxide of lithium (a compd. of lithium with an inorg. oxide). The absorption material 3 is used in a cartridge exchange system, detached and treated after the lapse of a certain period of time or a function to regenerate the absorption material 3 is provided to a car body and CO₂ generated at the time of regeneration is recovered.

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(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平11-262631

(43) 公開日 平成11年(1999) 9月28日

(51) IntCl⁵

識別記号

F I

B 0 1 D 53/62

B 0 1 D 53/34

1 3 5 Z

53/14

53/14

A

53/94

B 0 1 J 20/04

C

B 0 1 J 20/04

B 0 1 D 53/36

1 0 3 Z

審査請求 未請求 請求項の数 2 O L (全 4 頁)

(21) 出願番号

特願平10-66658

(22) 出願日

平成10年(1998) 3月17日

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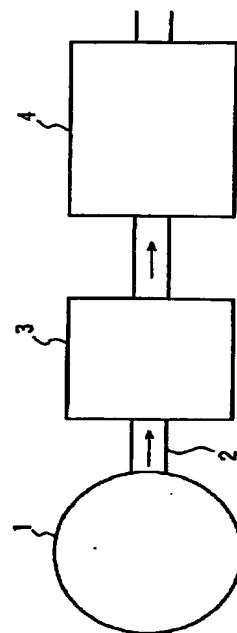
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(54) 【発明の名称】 排ガス浄化システム

(57) 【要約】

【課題】 自動車等の排気ガスから大気中に放出される有害成分を大幅に低減することが可能な排気ガス浄化システムを提供する。

【解決手段】 炭化水素系成分を燃料とする燃焼器と、前記燃焼器の排気ガスが流通する排気管に配置された排ガス浄化触媒とを具備し、CO₂を400℃以上の温度で吸収する炭酸ガス吸収材は、前記燃焼器と前記浄化触媒の間の前記排気管に配置されることを特徴とする。



【特許請求の範囲】

【請求項1】炭化水素系成分を燃料とする燃焼器と、前記燃焼器の排気ガスが流通する排気管に配置された排ガス浄化触媒と、前記燃焼器と前記浄化触媒の間の前記排気管に配置される CO_2 を 400°C 以上の温度で吸収する炭酸ガス吸収材とを具備したことを特徴とする排気ガス浄化システム。

【請求項2】前記炭酸ガス吸収材は、リチウムの複合酸化物であることを特徴とする請求項1記載の排気ガス浄化システム。

【発明の詳細な説明】

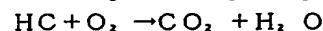
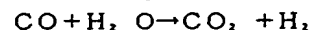
【0001】

【発明が属する技術分野】本発明は、自動車の排気ガスの浄化や、炭化水素系成分を燃料とするエネルギープラントや化学プラントの排気ガスの浄化に応用される排気ガス浄化システムに関する。

【0002】

【従来の技術】例えば、自動車の排気ガスに含有される有害物質である一酸化炭素(CO)、窒素酸化物(NO_x)、炭化水素(HC)は、空気比(空気と燃料の混合比)の最適化と三元触媒と称される排気ガス浄化触媒(Ru 、 Pt などの貴金属)の作用により低減される。

【0003】前記 CO 、 HC は、次式の反応にしたがって炭酸ガス(CO_2)と水素(H_2)、炭酸ガス(CO_2)と水(H_2O)を生成する。



しかしながら、前記 CO 、 HC の反応において CO_2 が多く存在すると、 CO の酸化等が円滑に進行しないことが予想される。また、 CO の酸化により生成した CO_2 は地球温暖化防止の観点からも大気中に放出されることは好ましくない。

【0004】

【発明が解決しようとする課題】本発明は、自動車等の排気ガスから大気中に放出される有害成分を大幅に低減することが可能な排気ガス浄化システムを提供しようとするものである。

【0005】

【課題を解決するための手段】本発明に係わる排気ガス浄化システムは、炭化水素系成分を燃料とする燃焼器と、前記燃焼器の排気ガスが流通する排気管に配置された排ガス浄化触媒と、前記燃焼器と前記浄化触媒の間の前記排気管に配置される CO_2 を 400°C 以上の温度で吸収する炭酸ガス吸収材とを具備したことを特徴とするものである。前記炭酸ガス吸収材は、リチウムの複合酸化物であることが好ましい。

【0006】

【発明の実施の形態】以下、本発明に係わる排気ガス浄化システムを図面を参照して詳細に説明する。図1は、

本発明の排気ガス浄化システムを示す概略図である。図中の1は、炭化水素系成分を燃料とする燃焼器である。排気管2は、前記燃焼器1に連結され、その排気ガスが流通する。 CO_2 を 400°C 以上の温度で吸収する炭酸ガス吸収材3は、前記排気管2に配置され、さらに排ガス浄化触媒4は前記炭酸ガス吸収材3後段の前記排気管2に配置されている。

【0007】前記燃焼器1の燃料は、炭化水素系成分であれば特に限定されないが、具体的にはガソリン、メタノールが用いられる。前記燃焼器としては、例えばガソリンエンジン、ディーゼルエンジン等を挙げることができる。

【0008】前記排ガス浄化触媒としては、例えば Ru 、 Pt 、 Pd などの貴金属、 Ni 、 Fe 、 Co 等の酸化物等を挙げることかできる。前記炭酸ガス吸収材は、 CO_2 を 400°C 以上の温度で吸収する性質を有する材料である。具体的には、リチウムの複合酸化物(リチウムと無機酸化物の化合物)が挙げられる。この無機酸化物としては、例えば ZrO_2 、 Al_2O_3 、 MgO 、 CaO 、 Fe_2O_3 、 CeO_2 、 TiO_2 、 NiO 等を挙げることができる。

【0009】前記リチウムの複合酸化物、例えばリチウムジルコネート; Li_2ZrO_4 は、 400°C 以上の温度下でリチウムが CO_2 と反応して Li_2CO_3 と ZrO_2 を生成する。 CO_2 吸収反応を生じる。また、前記リチウムの複合酸化物、例えばリチウムジルコネート; Li_2ZrO_4 は CO_2 を吸収した温度域より高温領域で Li_2CO_3 と ZrO_2 とから再びリチウムの複合酸化物(Li_2ZrO_4)に戻る、 CO_2 放出反応を起こす。

【0010】前記 CO_2 の吸収・放出の温度領域は、リチウムの複合酸化物の種類により異なる。例えば、 Li_2 と ZrO_2 との複合酸化物である Li_2ZrO_4 は CO_2 吸収反応が $400\sim 580^\circ\text{C}$ で起こり、 CO_2 放出反応は 600°C 以上の温度で起こる。

【0011】すなわち、前記リチウムの複合酸化物からなる炭酸ガス吸収材は CO_2 の吸収温度で一定期間使用した後、 CO_2 の放出反応が生じて再生されることが必要である。このような形態の炭酸ガス吸収材を実現するには、例えば炭酸ガス吸収材をカートリッジ交換方式とし、一定期間経過後に取り外して処理する方法、または自動車の車体に炭酸ガス吸収材の再生機能を付加し、再生時に発生する CO_2 を回収する方法が採用される。

【0012】前記炭酸ガス吸収材の形態は、例えば円柱形状のベレットとし、これを容器内に充填する形態またはハニカム構造体が挙げられる。前記炭酸ガス吸収材の量は、排気ガス量に応じて調節される。例えば、炭酸ガス吸収材をカートリッジ方式にする場合には、炭酸ガス吸収材を予めカートリッジ内に交換時まで所定量の CO_2 を吸収する能力が維持される量を充填する。具体的に

は、排気ガス量が3L/minで、24時間後にカートリッジを交換する場合、炭酸ガス吸収材の量を約2.2kg (Li₂ZrO₃の場合) にすることが好ましい。

【0013】前記炭酸ガス吸収材は、400℃以上の温度にする観点から前述した図1に示す燃焼器1の近傍に配置することが好ましい。以上説明した本発明の排気ガス浄化システムは、炭化水素系成分を燃料とする燃焼器と、前記燃焼器の排気ガスが流通する排気管に配置された排ガス浄化触媒とを具備し、前記燃焼器と前記浄化触媒の間の前記排気管にCO₂を400℃以上の温度で吸

収する炭酸ガス吸収材を配置した構造を有するため、排気ガス中のCO、HC、NO_x等の有害物質を大幅に低減することができる。

【0014】すなわち、ガソリンエンジンで空燃比を最適化して運転した燃焼排ガスの組成はCO 0.3%、NO 0.05~0.15%、H₂O 約13%、H₂ 0.1~0.3%、HC 0.03~0.08%、SO_x 約0.002%、O₂ 0.2~0.5%、CO₂ 約12%、残りN₂であり、CO₂が全体の約12%を占めている。また、排気ガス中の成分は触媒の存在下で次のような(1)~(3)等の反

応がなされる。

【0015】

$$\text{CO} + \text{H}_2\text{O} \rightarrow \text{CO}_2 + \text{H}_2 \quad \dots (1)$$

$$\text{HC} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O} \quad \dots (2)$$

$$2\text{NO} + 2\text{CO} \rightarrow 2\text{CO}_2 + \text{N}_2 \quad \dots (3)$$

このような燃焼排ガスの成分組成および触媒の存在下でのCO、HCの反応、特に(1)式の反応において、反応生成物であるCO₂をトラップすることにより右側の反応が促進される。前述した図1に示すように燃焼排ガスの流路である排気管2の排気ガス浄化触媒4の前段に炭酸ガス吸収材3を配置することにより、前記燃焼排気ガスの成分組成中に12%占めるCO₂を吸収して低減できるために、この吸収材3の後段の排気ガス浄化触媒4に導入される排気ガスのCO₂の分圧を低減できる。その結果、前記(1)式の右側への反応が促進、つまりCOのCO₂への生成が促進、されるため、自動車から排出される排気ガス中のCO量を大幅に低減することができる。また、前記(2)、(3)式からHC、NO_xの量も低減することができる。従って、本発明によれば排気ガス中のCO、HC、NO_x等の有害物質を大

幅に低減することができる。

【0016】

【実施例】以下、本発明の好ましい実施例を詳細に説明する。

(実施例1) まず、Li₂ZrO₃からなる直径10mmの円柱状ペレット約3kgが充填されたカートリッジを図1に示す炭酸ガス吸収材とし組み込み、かつ排気ガス浄化触媒4としてRu-Pt-Pdからなるものを用いた。

【0017】燃焼器1からガソリンエンジンの燃焼排気

ガス組成を模擬した下記表1に示すガス(400~500℃に予め加熱)を排気管2を通して3L/minの流量で前記炭酸ガス吸収材3に導入し、さらに排気ガス浄化触媒4を流通させ、24時間経過後における前記触媒の出口側のガス組成を分析した。その結果を下記表2に示す。

【0018】(実施例2) まず、直径200mm、長さ100mmで1cm²当たり50個のセルを有するコーディエライト製円柱状ハニカム構造基材にLi₂ZrO₃を含むスラリーを固形分換算で4.5kgコートし、大気中、800℃で焼成し、えられた構造物を前述した図1に示す炭酸ガス吸収材とし組み込み、かつ排気ガス浄化触媒4としてRu-Pt-Pdからなるものを用いた。

【0019】燃焼器1からガソリンエンジンの燃焼排気ガス組成を模擬した下記表1に示すガス(400~500℃に予め加熱)を排気管2を通して6L/minの流量で前記炭酸ガス吸収材3に導入し、さらに排気ガス浄化触媒4を流通させ、24時間経過後における前記触媒の出口側のガス組成を分析した。その結果を下記表2に示す。

【0020】(実施例3) 実施例1においてCO₂を吸収した後の炭酸ガス吸収材に650℃の空気を流通させた後、再び、実施例1と同様に燃焼器1からガソリンエンジンの燃焼排気ガス組成を模擬した下記表1に示すガス(400~500℃に予め加熱)を排気管2を通して3L/minの流量で前記炭酸ガス吸収材3に導入し、さらに排気ガス浄化触媒4を流通させ、24時間経過後における前記触媒の出口側のガス組成を分析した。その結果を下記表2に示す。

【0021】(比較例1) 排気管にRu-Pt-Pdからなる排気ガス浄化触媒のみを配置した以外、実施例1と同様にガソリンエンジンの燃焼排気ガス組成を模擬した下記表1に示すガス(400~500℃に予め加熱)を排気管を通して3L/minの流量で排気ガス浄化触媒を流通させ、24時間経過後における前記触媒の出口側のガス組成を分析した。その結果を下記表2に示す。

【0022】

【表1】

ガス成分	濃度 (vol%)
C ₃ H ₈ (HC)	0.03
NO	0.07
CO	0.5
H ₂ O	13
CO ₂	12
O ₂	0.4
N ₂	バランス

【0023】

【表2】

	CO ₂ (vol%)	CO (vol%)	HC (vol%)	NO (vol%)
投入ガス	12	0.5	0.03	0.07
実施例1	3	0.1	0.01	0.04
実施例2	2	0.05	0.01	0.04
実施例3	3	0.09	0.01	0.045
比較例1	12.3	0.3	0.02	0.06

【0024】前記表2から明らかなように炭酸ガス吸収材を排気ガス浄化触媒の前段に配置した実施例1、2の浄化システムは、排気ガス浄化触媒のみを配置した比較例1の浄化システムに比べてCO、HC、NO_xの有害物質を効果的に低減できることがわかる。

【0025】また、実施例3に示すようにCO₂を吸収した後、再生した炭酸ガス吸収材を用いた場合でも、実施例1と同様、CO、HC、NO_xの有害物質を効果的に低減できることがわかる。

【0026】

【発明の効果】以上詳述したように本発明に係わる排気ガス浄化システムは、排気ガス中のCO、HC、NO_x *

*の有害物質を効果的に低減できるため、自動車、エネルギープラント、化学プラント等に有効に適用することができる。

【図面の簡単な説明】

【図1】本発明に係わる排気ガス浄化システムを示す概略図。

【符号の説明】

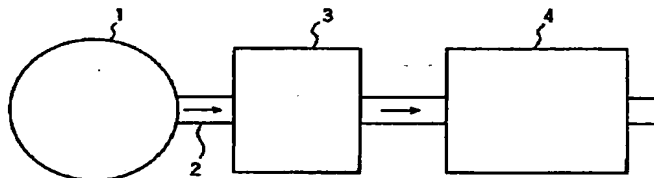
1…燃焼器、

20 2…排気管、

3…炭酸ガス吸収材、

4…排気ガス浄化触媒。

【図1】



PATENT ABSTRACTS OF JAPAN

(11)Publication number : 11-262631

(43)Date of publication of application : 28.09.1999

(51)Int.Cl.

B01D 53/62

B01D 53/14

B01D 53/94

B01J 20/04

(21)Application number : 10-066658

(71)Applicant : TOSHIBA CORP

(22)Date of filing : 17.03.1998

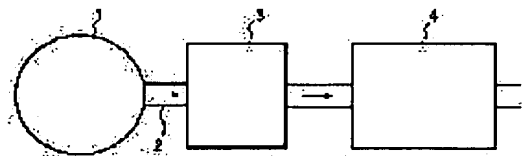
(72)Inventor : OHASHI TOSHIYUKI
NAKAGAWA KAZUAKI

(54) EXHAUST GAS CLEANING SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To considerably reduce harmful components discharged from auto exhaust gas, etc., into the air by disposing a gaseous CO₂ absorption material that absorbs CO₂ at a specified temp. or above in an exhaust pipe between a burner using a hydrocarbon component as fuel and an exhaust gas cleaning catalyst through which the exhaust gas of the burner passes.

SOLUTION: A gaseous CO₂ absorption material 3 that absorbs CO₂ at $\geq 400^{\circ}\text{C}$ is connected to a burner 1 using a hydrocarbon component as fuel by way of an exhaust pipe 2 and an exhaust gas cleaning catalyst 4 is disposed in the exhaust pipe 2 behind the absorption material 3. As the absorption material 3 which has properties to absorb CO₂ at $\geq 400^{\circ}\text{C}$ is cited, e.g. a conjugated oxide of lithium (a compd. of lithium with an inorg. oxide). The absorption material 3 is used in a cartridge exchange system, detached and treated after the lapse of a certain period of time or a function to regenerate the absorption material 3 is provided to a car body and CO₂ generated at the time of regeneration is recovered.



LEGAL STATUS

[Date of request for examination]

07.03.2001

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

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CLAIMS

[Claim(s)]

[Claim 1] CO₂ arranged at said exhaust pipe between the emission-gas-purification catalyst arranged at the combustor which uses a hydrocarbon system component as a fuel, and the exhaust pipe with which the exhaust gas of said combustor circulates, and said combustor and said purification catalyst Exhaust gas purification system characterized by providing the carbon-dioxide-gas absorber absorbed at the temperature of 400 degrees C or more.

[Claim 2] Said carbon-dioxide-gas absorber is an exhaust gas purification system according to claim 1 characterized by being the multiple oxide of a lithium.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the exhaust gas purification system applied to purification of the exhaust gas of an automobile, the energy plant which uses a hydrocarbon system component as a fuel, or a chemical processing plant.

[0002]

[Description of the Prior Art] For example, the carbon monoxide (CO) which is the harmful matter contained in the exhaust gas of an automobile, nitrogen oxides (NOx), and a hydrocarbon (HC) are reduced according to an operation of the exhaust gas purification catalyst (noble metals, such as Ru and Pt) called optimization and the three way component catalyst of an excess air ratio (mixing ratio of air and a fuel).

[0003] Said CO and HC generate carbon dioxide gas (CO₂), hydrogen (H₂) and carbon dioxide gas (CO₂), and water (H₂ O) according to the reaction of a degree type.

It sets for said reaction of CO and HC, and is [CO+H₂ O->CO₂+H₂ HC+O₂ ->CO₂+H₂ O, however] CO₂. If it exists mostly, it will be expected that oxidation of CO etc. does not advance smoothly. Moreover, CO₂ generated by oxidation of CO It is not desirable to be emitted into atmospheric air also from a viewpoint of global warming prevention.

[0004]

[Problem(s) to be Solved by the Invention] This invention tends to offer the exhaust gas purification system which can reduce sharply the injurious ingredient emitted into atmospheric air from exhaust gas, such as an automobile.

[0005]

[Means for Solving the Problem] The exhaust gas purification system concerning this invention is CO₂ arranged at said exhaust pipe between the emission-gas-purification catalyst arranged at the combustor which uses a hydrocarbon system component as a fuel, and the exhaust pipe with which the exhaust gas of said combustor circulates, and said combustor and said purification catalyst. It is characterized by providing the carbon-dioxide-gas absorber absorbed at the temperature of 400 degrees C or more. As for said carbon-dioxide-gas absorber, it is desirable that it is the multiple oxide of a lithium.

[0006]

[Embodiment of the Invention] Hereafter, the exhaust gas purification system concerning this invention is explained to a detail with reference to a drawing. Drawing 1 is the schematic diagram showing the exhaust gas purification system of this invention. One in drawing is a combustor which uses a hydrocarbon system component as a fuel. An exhaust pipe 2 is connected with said combustor 1, and the exhaust gas circulates. CO₂ The carbon-dioxide-gas absorber 3 absorbed at the temperature of 400 degrees C or more is arranged at said exhaust pipe 2, and the emission-gas-purification catalyst 4 is arranged further at said exhaust pipe 2 of said carbon-dioxide-gas absorber 3 latter part.

[0007] Although it will not be limited especially if the fuel of said combustor 1 is a hydrocarbon system component, a gasoline and a methanol are specifically used. As said combustor, a gasoline engine, a diesel power plant, etc. can be mentioned, for example.

[0008] The above is possible as an emission-gas-purification catalyst in mentioning oxides, such as noble metals, such as Ru, Pt, and Pd, and nickel, Fe, Co, etc., for example. Said carbon-dioxide-gas absorber is CO₂. It is the ingredient which has the property absorbed at the temperature of 400 degrees C or more. Specifically,

the multiple oxide (compound of a lithium and an inorganic oxide) of a lithium is mentioned. As this inorganic oxide, ZrO₂, aluminum 2O₃, MgO, CaO and Fe 2O₃, CeO₂, TiO₂, NiO, etc. can be mentioned, for example. [0009] (The multiple oxide 3, for example, lithium zirconate; Li₂ ZrO, of said lithium A lithium is CO₂ under the temperature of 400 degrees C or more. It reacts and is Li₂ CO₃. CO₂ which generates ZrO₂ An absorption reaction is produced.) moreover, the multiple oxide 3 of said lithium, for example, lithium zirconate; Li₂ ZrO, CO₂ the absorbed temperature region -- an elevated-temperature field -- Li₂ CO₃ ZrO₂ from -- CO₂ which returns to the multiple oxide (Li₂ ZrO₃) of a lithium again Release reaction is caused.

[0010] Said CO₂ The temperature field of absorption and emission changes with classes of multiple oxide of a lithium. For example, Li and ZrO₂ Li₂ ZrO₃ which is a multiple oxide CO₂ An absorption reaction occurs at 400-580 degrees C, and it is CO₂. Release reaction occurs at the temperature of 600 degrees C or more.

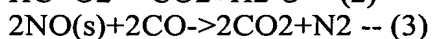
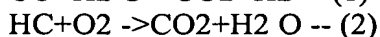
[0011] That is, the carbon-dioxide-gas absorber which consists of a multiple oxide of said lithium is CO₂. CO₂ after carrying out fixed period use at absorption temperature It is required for release reaction to arise and to reproduce it. In order to realize the carbon-dioxide-gas absorber of such a gestalt, a carbon-dioxide-gas absorber is made into cartridge exchange system, the regenerative function of a carbon-dioxide-gas absorber is added to the car body of the approach of removing and processing after fixed period progress, or an automobile, and the method of collecting CO₂ generated at the time of playback is adopted.

[0012] The gestalt of said carbon-dioxide-gas absorber is made into the pellet of the shape for example, of a cylindrical shape, and the gestalt or honeycomb structure object filled up with this in a container is mentioned. The amount of said carbon-dioxide-gas absorber is adjusted according to the amount of exhaust gas. For example, when making a carbon-dioxide-gas absorber into a cartridge type, it is a carbon-dioxide-gas absorber in a cartridge beforehand till exchange CO₂ of the specified quantity It is filled up with the amount in which the capacity to absorb is maintained. The amount of exhaust gas is 3 L/min, and when exchanging cartridges 24 hours after, specifically, it is desirable to set the amount of a carbon-dioxide-gas absorber to about 2.2kg (in the case of Li₂ ZrO₃).

[0013] As for said carbon-dioxide-gas absorber, it is desirable to arrange near the combustor 1 shown in drawing 1 mentioned above from a viewpoint made into the temperature of 400 degrees C or more. The exhaust gas purification system of this invention explained above The emission-gas-purification catalyst arranged at the combustor which uses a hydrocarbon system component as a fuel, and the exhaust pipe with which the exhaust gas of said combustor circulates is provided. said exhaust pipe between said combustors and said purification catalysts -- CO₂ since it has the structure which has arranged the carbon-dioxide-gas absorber absorbed at the temperature of 400 degrees C or more -- CO, HC, and NO_x in exhaust gas etc. -- harmful matter can be reduced sharply.

[0014] namely, the presentation of the combustion gas which optimized the air-fuel ratio and was operated by the gasoline engine -- CO about 0.002 %, O₂ 0.2 - 0.5 %, and CO []₂ -- about 12%, it is the remainder N₂ and CO₂ forms about 12% of the whole. 0.3 % and NO 0.05 - 0.15%, and H₂ O About 13% and H₂ 0.1 - 0.3 % and HC 0.03 - 0.08%, and SO₂ Moreover, as for the component in exhaust gas, reactions, such as following (1) - (3), are made under existence of a catalyst.

[0015]



CO under the component presentation of such combustion exhaust gas, and existence of a catalyst, the reaction of HC, and CO₂ that is a resultant especially in the reaction of (1) type A right-hand side reaction is promoted by carrying out a trap. CO₂ occupied 12% during the component presentation of said combustion exhaust gas by arranging the carbon-dioxide-gas absorber 3 in the preceding paragraph of the exhaust gas purification catalyst 4 of the exhaust pipe 2 which is the passage of a combustion gas as shown in drawing 1 mentioned above CO₂ of the exhaust gas which absorbs, and is introduced into the exhaust gas purification catalyst 4 of the latter part of this absorber 3 since it can decrease A partial pressure can be reduced. Consequently, a reaction on the right-hand side of the aforementioned (1) formula is CO₂ of promotion, i.e., CO. Since generation is promoted and carried out, the amount of COs in the exhaust gas discharged from an automobile can be reduced sharply. Moreover, the above (2) and (3) types to HC and NO_x An amount can also be reduced. therefore -- according to this invention -- CO, HC, and NO_x in exhaust gas etc. -- harmful matter can be

reduced sharply.

[0016]

[Example] Hereafter, the desirable example of this invention is explained to a detail.

(Example 1) first -- Li_2ZrO_3 from -- what makes the cartridge with which cylindrical with a diameter of 10mm becoming pellet about 3kg was filled up the carbon-dioxide-gas absorber shown in drawing 1, and incorporates it, and consists of Ru-Pt-Pd as an exhaust gas purification catalyst 4 was used.

[0017] The gas (it heats beforehand at 400-500 degrees C) shown in the following table 1 which simulated the combustion exhaust gas presentation of a gasoline engine from the combustor 1 was introduced into said carbon-dioxide-gas absorber 3 by the flow rate of 3 L/min through the exhaust pipe 2, the exhaust gas purification catalyst 4 was circulated further, and the gas presentation of the outlet side of said catalyst after 24-hour progress was analyzed. The result is shown in the following table 2.

[0018] (Example 2) It is 2 lcm at the diameter of 200mm, and die length of 100mm first. It is Li_2ZrO_3 to the cylindrical honeycomb structure base material made from cordierite which has the cel of 50 hits. What carries out 4.5kg coat of the included slurry by solid content conversion, considers as the carbon-dioxide-gas absorber shown in drawing 1 which calcinated and mentioned the obtained structure above, and incorporates at 800 degrees C among atmospheric air, and consists of Ru-Pt-Pd as an exhaust gas purification catalyst 4 be used

[0019] The gas (it heats beforehand at 400-500 degrees C) shown in the following table 1 which simulated the combustion exhaust gas presentation of a gasoline engine from the combustor 1 was introduced into said carbon-dioxide-gas absorber 3 by the flow rate of 6 L/min through the exhaust pipe 2, the exhaust gas purification catalyst 4 was circulated further, and the gas presentation of the outlet side of said catalyst after 24-hour progress was analyzed. The result is shown in the following table 2.

[0020] (Example 3) It sets in the example 1 and is CO_2 . After circulating 650-degree C air to the carbon-dioxide-gas absorber after absorbing, The gas (it heats beforehand at 400-500 degrees C) shown in the following table 1 which simulated the combustion exhaust gas presentation of a gasoline engine is again introduced into said carbon-dioxide-gas absorber 3 by the flow rate of 3 L/min through an exhaust pipe 2 from a combustor 1 like an example 1. Furthermore the exhaust gas purification catalyst 4 was circulated, and the gas presentation of the outlet side of said catalyst after 24-hour progress was analyzed. The result is shown in the following table 2.

[0021] (Example 1 of a comparison) Except having arranged only the exhaust gas purification catalyst which becomes an exhaust pipe from Ru-Pt-Pd, the gas (it heats beforehand at 400-500 degrees C) shown in the following table 1 which simulated the combustion exhaust gas presentation of a gasoline engine like the example 1 circulated the exhaust gas purification catalyst by the flow rate of 3 L/min through the exhaust pipe, and the gas presentation of the outlet side of said catalyst after 24-hour progress was analyzed. The result is shown in the following table 2.

[0022]

[Table 1]

ガス成分	濃度 (vol%)
C_3H_8 (HC)	0.03
NO	0.07
CO	0.5
H_2O	13
CO_2	12
O_2	0.4
N_2	バランス

[0023]

[Table 2]

	CO ₂ (vol%)	CO (vol%)	HC (vol%)	NO (vol%)
投入ガス	12	0.5	0.03	0.07
実施例1	3	0.1	0.01	0.04
実施例2	2	0.05	0.01	0.04
実施例3	3	0.09	0.01	0.045
比較例1	12.3	0.3	0.02	0.06

[0024] It compares with the purification system of the example 1 of a comparison which has arranged only the exhaust gas purification catalyst, and the purification system of the examples 1 and 2 which have arranged the carbon-dioxide-gas absorber in the preceding paragraph of an exhaust gas purification catalyst so that clearly from said table 2 is CO, HC, and NO_x. It turns out that harmful matter can be reduced effectively.

[0025] Moreover, it is CO₂ as shown in an example 3. They are CO, HC, and NO_x like [even when the reproduced carbon-dioxide-gas absorber is used after absorbing] an example 1. It turns out that harmful matter can be reduced effectively.

[0026]

[Effect of the Invention] The exhaust gas purification system concerning [as explained in full detail above] this invention is CO, HC, and NO_x in exhaust gas. Since harmful matter can be reduced effectively, it is applicable effective in an automobile, an energy plant, a chemical processing plant, etc.

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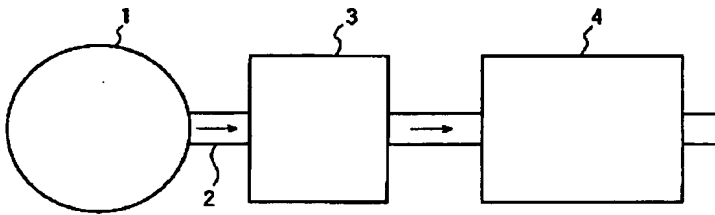
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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

[Drawing 1]



[Translation done.]